109TH CONGRESS
2D SESSION

S. 2197

To improve the global competitiveness of the United States in science and energy technology, to strengthen basic research programs at the Department of Energy, and to provide support for mathematics and science education at all levels through the resources available through the Department of Energy, including at the National Laboratories.

IN THE SENATE OF THE UNITED STATES

JANUARY 26, 2006

Mr. DOMENICI (for himself, Mr. BINGAMAN, Mr. ALEXANDER, Ms. MIKULSKI, Mr. LUGAR, Mr. DODD, Mr. HATCH, Mr. OBAMA, Mr. WARNER, Mr. LIEBERMAN, Mr. BOND, Mrs. MURRAY, Mr. BURNS, Mr. BAYH, Mr. CRAIG, Ms. CANTWELL, Mrs. HUTCHISON, Mr. MENENDEZ, Mr. DEWINE, Mr. KOHL, Mr. THOMAS, Mr. KERRY, Mr. SMITH, Mr. NELSON of Florida, Mr. VOINOVICH, Mr. LEAHY, Mr. ALLEN, Mr. AKAKA, Mr. TALENT, Mrs. CLINTON, Mr. CHAMBLISS, Ms. STABENOW, Mr. CORNYN, Mr. DAYTON, Mr. COLEMAN, Mr. SALAZAR, Mr. MARTINEZ, Mr. INOUYE, Mr. STEVENS, Mr. BIDEN, Mr. COCHRAN, Mr. HAGEL, Ms. MURKOWSKI, Mr. PRYOR, Ms. COLLINS, Mr. VITTER, and Ms. LANDRIEU) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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A BILL

To improve the global competitiveness of the United States in science and energy technology, to strengthen basic research programs at the Department of Energy, and to provide support for mathematics and science education at all levels through the resources available through the Department of Energy, including at the National Laboratories.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Protecting America's Competitive Edge Through Energy Act of 2006'' or the ''PACE–Energy Act''.

SEC. 2. MATHEMATICS, SCIENCE, AND ENGINEERING EDUCATION AT THE DEPARTMENT OF ENERGY.

(a) SCIENCE EDUCATION PROGRAMS.—Section 3164 of the Department of Energy Science Education Enhancement Act (42 U.S.C. 7381a) is amended—

(1) by redesignating subsections (b) through (d) as subsections (c) through (e), respectively;

(2) by inserting after subsection (a) the following:

''(b) ORGANIZATION OF MATHEMATICS, SCIENCE, AND ENGINEERING EDUCATION PROGRAMS.—

''(1) DIRECTOR OF MATHEMATICS, SCIENCE AND ENGINEERING EDUCATION.—The Secretary, acting through the Under Secretary for Science (referred to in this subsection as the 'Under Secretary'), shall appoint a Director of Mathematics, Science, and Engineering Education (referred to in this subsection as the 'Director') with the principal responsibility for administering mathematics,

science, and engineering education programs of the Department.

''(2) QUALIFICATIONS.—The Director shall be an individual, who by reason of professional background and experience, is specially qualified to advise the Under Secretary on all matters pertaining to mathematics, science, and engineering education at the Department.

''(3) DUTIES.—The Director shall—

''(A) oversee all mathematics, science, and engineering education programs of the Department;

''(B) represent the Department as the principal interagency liaison for all mathematics, science, and engineering education programs, unless otherwise represented by the Secretary or the Under Secretary;

''(C) prepare the annual budget and advise the Under Secretary on all budgetary issues for mathematics, science, and engineering education programs of the Department; and

''(D) perform other such matters related to mathematics, science, and engineering education as are required by the Secretary or the Under Secretary.

''(4) STAFF AND OTHER RESOURCES.—The Secretary shall assign to the Director such personnel and other resources as the Secretary considers necessary to permit the Director to carry out the duties of the Director.

''(5) ASSESSMENT.—The Secretary shall offer to enter into a contract with the National Academy of Sciences under which the National Academy, not later than 5 years after, and not later than 10 years after, the date of enactment of this paragraph, shall assess the performance of the mathematics, science, and engineering education programs of the Department.

''(6) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated such sums as are necessary to carry out this subsection.''; and

(3) by striking subsection (d) (as redesignated by paragraph (1)) and inserting the following:

''(d) MATHEMATICS, SCIENCE, AND ENGINEERING EDUCATION FUND.—The Secretary shall establish a Mathematics, Science, and Engineering Education Fund, using not less than 0.3 percent of the amount made available to the Department for research, development, demonstration, and commercial application for each fiscal year, to carry out sections 3165, 3166, and 3167.''.

(b) DEFINITION.—Section 3168 of the Department of Energy Science Education Enhancement Act (42 U.S.C. 7381d) is amended by adding at the end the following:

''(5) NATIONAL LABORATORY.—The term 'National Laboratory' has the meaning given the term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).''.

(c) MATHEMATICS, SCIENCE, AND ENGINEERING EDUCATION PROGRAMS.—The Department of Energy Science Education Enhancement Act (42 U.S.C. 7381 et seq.) is amended—

(1) by inserting after section 3162 the following:

''Subpart A—Science Education Enhancement'';

(2) in section 3169, by striking ''part'' and inserting ''subpart''; and

(3) by adding at the end the following:

''Subpart B—Mathematics, Science, and Engineering Education Programs

''SEC. 3170. DEFINITIONS.

''In this subpart:

''(1) DIRECTOR.—The term 'Director' means the Director of Mathematics, Science, and Engineering Education.

''(2) NATIONAL LABORATORY.—The term 'National Laboratory' has the meaning given the term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

"CHAPTER 1—ASSISTANCE FOR SPECIALTY SCHOOLS FOR MATHEMATICS AND SCIENCE

"SEC. 3171. ASSISTANCE FOR SPECIALTY SCHOOLS FOR MATHEMATICS AND SCIENCE.

''(a) IN GENERAL.—Consistent with sections 3165 and 3166, the Director shall make available necessary funds for a program using scientific and engineering staff of the National Laboratories, in which the staff—

''(1) assists teaching courses at statewide specialty secondary schools that provide comprehensive mathematics and science (including engineering) education; and

''(2) uses National Laboratory scientific equipment in the teaching of the courses.

''(b) REPORT TO CONGRESS.—Not later than 2 years after the date of enactment of the Protecting America's Competitive Edge Through Energy Act of 2006, the Director shall submit a report to the appropriate committees of Congress detailing the impact of the activities assisted with funds made available under this section.

"CHAPTER 2—EXPERIENTIAL-BASED LEARNING OPPORTUNITIES

"SEC. 3175. EXPERIENTIAL-BASED LEARNING OPPORTUNITIES.

"(a) INTERNSHIPS AUTHORIZED.—From the amounts authorized under subsection (d), the Secretary, acting through the Director, shall establish a summer internship program for middle school and secondary school students that shall—

"(1) provide the students with internships at the National Laboratories; and

"(2) promote experiential, hands-on learning in mathematics or science.

"(b) ELIGIBILITY CRITERIA.—The Director shall establish criteria to determine the sufficient level of academic preparedness necessary for a student to be eligible for an internship under this section.

"(c) PRIORITY.—

"(1) IN GENERAL.—The Director shall give priority for an internship under this section to a student who meets the eligibility criteria described in subsection (b) and who attends a school—

"(A)(i) in which not less than 40 percent of the children enrolled in the school are from low-income families; or

''(ii) that is designated with a school locale code of 7 or 8, as determined by the Secretary of Education; and

''(B) for which there is—

''(i) a high percentage of teachers who are not teaching in the academic subject areas or grade levels in which the teachers were trained to teach;

''(ii) a high teacher turnover rate; or

''(iii) a high percentage of teachers with emergency, provisional, or temporary certification or licenses.

''(2) COORDINATION.—The Director shall consult with the Secretary of Education in order to determine whether a student meets the priority requirements of this subsection.

''(d) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section $50,000,000 for each of the fiscal years 2007 through 2013.

"CHAPTER 3—NATIONAL LABORATORIES CENTERS OF EXCELLENCE IN MATHEMATICS AND SCIENCE EDUCATION

"SEC. 3181. NATIONAL LABORATORIES CENTERS OF EXCELLENCE IN MATHEMATICS AND SCIENCE EDUCATION.

''(a) IN GENERAL.—The Secretary shall establish at each of the National Laboratories a program to support a Center of Excellence in Mathematics and Science at 1 public secondary school located in the region of the National Laboratory to provide assistance in accordance with subsection (c).

''(b) GOALS.—The Secretary shall establish goals and performance assessments for each Center of Excellence authorized under subsection (a).

''(c) ASSISTANCE.—Consistent with sections 3165 and 3166, the Director shall make available necessary funds for a program using scientific and engineering staff of the National Laboratories, during which the staff—

''(1) assists teaching courses at the Centers of Excellence in Mathematics and Science; and

''(2) uses National Laboratory scientific equipment in the teaching of the courses.

''(d) EVALUATION.—The Secretary shall consider the results of the performance assessments required under

subsection (b) in any performance review of a National Laboratories management and operations contractor.

"CHAPTER 4—SUMMER INSTITUTES

"SEC. 3185. SUMMER INSTITUTES.

"(a) DEFINITION OF SUMMER INSTITUTE.—In this section, the term 'summer institute' means an institute at a National Laboratory, conducted during the summer, that—

"(1) is conducted for a period of not less than 2 weeks;

"(2) includes, as a component, a program that provides direct interaction between students and faculty; and

"(3) provides for follow-up training during the academic year.

"(b) SUMMER INSTITUTE PROGRAMS AUTHORIZED.—The Secretary, acting through the Director, shall establish or expand program of summer institutes at each of the National Laboratories to provide additional training to strengthen the mathematics and science teaching skills of teachers employed at public schools in kindergarten through grade 12 education, with a particular focus on teachers of kindergarten through grade 8.

"CHAPTER 5—DISTINGUISHED SCIENTIST PROGRAM

"SEC. 3191. DISTINGUISHED SCIENTIST PROGRAM.

''(a) PURPOSE.—The purpose of this section is to promote scientific and academic excellence at National Laboratories.

''(b) ESTABLISHMENT.—The Secretary, acting through the Director and in consultation with the Director of the Office of Science, shall establish a program to support the appointment of distinguished scientists by National Laboratories.

''(c) QUALIFICATIONS.—Successful candidates under this section shall be persons who, by reason of professional background and experience, are able to bring international recognition to the appointing National Laboratory in their field of scientific endeavor.

''(d) SELECTION.—A distinguished scientist appointed under this section shall be selected through an open peer review process.

''(e) APPOINTMENT.—An appointment by a National Laboratory under this section shall be at the rank of the highest grade of distinguished scientist or technical staff of the National Laboratory.

''(f) DURATION.—An appointment under this section shall be for 6 years, consisting of 2 3-year funding allotments.

''(g) USE OF FUNDS.—Funds made available under this section may be used for—

''(1) the salary of the distinguished scientist and support staff;

''(2) undergraduate, graduate, and post-doctoral appointments;

''(3) research-related equipment;

''(4) professional travel; and

''(5) such other requirements as the Director determines are necessary to carry out the purpose of the program.

''(h) REVIEW.—

''(1) IN GENERAL.—The appointment of a distinguished scientist under this section shall be reviewed at the end of the first 3-year allotment for the distinguished scientist through an open peer review process to determine if the appointment is meeting the purpose of this section under subsection (a).

''(2) FUNDING.—Funding of the appointment of the distinguished scientist for the second 3-year

allotment shall be determined based on the review conducted under paragraph (1).''.

SEC. 3. DEPARTMENT OF ENERGY EARLY-CAREER RESEARCH GRANTS.

(a) PURPOSE.—It is the purpose of this section to authorize research grants in the Department of Energy for early-career scientists and engineers for purposes of pursuing independent research.

(b) DEFINITION OF ELIGIBLE EARLY-CAREER RESEARCHER.—In this section, the term ''eligible early-career researcher'' means an individual who—

(1) completed a doctorate or other terminal degree not more than 10 years before the date of enactment of this Act and has demonstrated promise in the field of science, technology, engineering, or mathematics; or

(2) has an equivalent professional qualification in the field of science, technology, engineering, or mathematics.

(c) GRANT PROGRAM AUTHORIZED.—

(1) IN GENERAL.—The Secretary of Energy, through the Director of the Office of Science of the Department of Energy, shall award not less than 65 grants per year to outstanding eligible early-career researchers to support the work of such researchers

in the Department, particularly the National Laboratories, or other federally-funded research and development centers.

(2) APPLICATION.—An eligible early-career researcher who desires to receive a grant under this section shall submit to the Secretary of Energy an application at such time, in such manner, and accompanied by such information as the Secretary may require.

(3) SPECIAL CONSIDERATION.—In awarding grants under this section, the Secretary of Energy shall give special consideration to eligible early-career researchers who have followed alternative career paths such as working part-time or in non-academic settings, or who have taken a significant career break or other leave of absence.

(4) DURATION AND AMOUNT.—A grant under this section shall be 5 years in duration. An eligible early career-researcher who receives a grant under this section shall receive $100,000 for each year of the grant period.

(5) USE OF FUNDS.—An eligible early career-researcher who receives a grant under this section shall use the grant funds for basic research in natural sciences, engineering, mathematics, or computer

sciences at the Department of Energy, particularly the National Laboratories, or other federally-funded research and development center.

(6) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section—

(A) $6,500,000 for fiscal year 2007;

(B) $13,000,000 for fiscal year 2008;

(C) $19,500,000 for fiscal year 2009;

(D) $26,000,000 for fiscal year 2010; and

(E) $32,500,000 for fiscal year 2011.

SEC. 4. ADVANCED RESEARCH PROJECTS AUTHORITY-ENERGY.

(a) DEFINITIONS.—In this section:

(1) ARPA–E.—The term ''ARPA–E'' means the Advanced Research Projects Authority—Energy established under subsection (b).

(2) FUND.—The term ''Fund'' means the Acceleration Fund for Research and Development of Energy Technologies established under subsection (c).

(3) SECRETARY.—The term ''Secretary'' means the Secretary of Energy.

(4) UNDER SECRETARY.—The term ''Under Secretary'' means the position of Under Secretary

for Science established under section 202(b) of the Department of Energy Organization Act (42 U.S.C. 7132(b)).

(b) ARPA–E.—

(1) ESTABLISHMENT.—There is established the Advanced Research Projects Authority—Energy.

(2) DIRECTOR.—ARPA–E shall be headed by a Director, who shall be appointed by the Secretary and report to the Under Secretary.

(3) RESPONSIBILITIES.—The Director shall use the Fund to award competitive, merit-based grants, cooperative agreements, and contracts to public or private entities (including businesses, federally funded research and development centers, and institutions of higher education) to—

(A) support basic and applied energy research to promote revolutionary changes in technologies that would promote the missions of the Department of Energy;

(B) advance the development, testing, evaluation, and deployment of critical energy technologies; and

(C) accelerate prototyping and development of technologies that would address national energy priorities.

(4) TARGETED COMPETITIONS.—The Director may solicit proposals to address areas of national need in science and energy technology, as identified by the Director.

(5) COORDINATION.—The Director—

(A) shall ensure that the activities of ARPA–E are coordinated with activities of other appropriate research agencies; and

(B) may carry out projects under this section jointly with other agencies.

(6) PERSONNEL.—

(A) IN GENERAL.—In hiring personnel for ARPA–E, the Secretary shall have the hiring and management authorities described in section 1101 of the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999 (Public Law 105–261; 5 U.S.C. 3104 note).

(B) TERM.—The term of appointments for an employee under subparagraph (A) may not exceed 5 years, except that the Secretary may renew the term of appointment of the employee for an additional term of 5 years.

(7) DEMONSTRATIONS.—The Director shall periodically hold energy technology demonstrations to

improve contact among technology developers, vendors, and acquisition personnel.

(c) FUND.—

(1) ESTABLISHMENT.—There is established in the Treasury of the United States a revolving fund, to be known as the ''Acceleration Fund for Research and Development of Energy Technologies'', consisting of—

(A) such amounts as are appropriated to the Fund under paragraph (5); and

(B) any interest earned on investment of amounts in the Fund under paragraph (3).

(2) EXPENDITURES FROM FUND.—

(A) IN GENERAL.—Subject to subparagraph (B), on request by the Director, the Secretary of the Treasury shall transfer from the Fund to the Director such amounts as the Director determines are necessary to carry out this section.

(B) ADMINISTRATIVE EXPENSES.—An amount not exceeding 5 percent of the amounts in the Fund shall be available for each fiscal year to pay the administrative expenses necessary to carry out this section.

(3) INVESTMENT OF AMOUNTS.—

(A) IN GENERAL.—The Secretary of the Treasury shall invest such portion of the Fund as is not, in the judgment of the Secretary of the Treasury, required to meet current withdrawals.

(B) INTEREST-BEARING OBLIGATIONS.—Investments may be made only in interest-bearing obligations of the United States.

(C) ACQUISITION OF OBLIGATIONS.—For the purpose of investments under subparagraph (A), obligations may be acquired—

(i) on original issue at the issue price; or

(ii) by purchase of outstanding obligations at the market price.

(D) SALE OF OBLIGATIONS.—Any obligation acquired by the Fund may be sold by the Secretary of the Treasury at the market price.

(E) CREDITS TO FUND.—The interest on, and the proceeds from the sale or redemption of, any obligations held in the Fund shall be credited to, and form a part of, the Fund.

(4) TRANSFERS OF AMOUNTS.—

(A) IN GENERAL.—The amounts required to be transferred to the Fund under this sub-

section shall be transferred at least monthly from the general fund of the Treasury to the Fund on the basis of estimates made by the Secretary of the Treasury.

(B) ADJUSTMENTS.—Proper adjustment shall be made in amounts subsequently transferred to the extent prior estimates were in excess of or less than the amounts required to be transferred.

(5) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Fund—

(A) $300,000,000 for fiscal year 2007;

(B) $500,000,000 for fiscal year 2008;

(C) $700,000,000 for fiscal year 2009;

(D) $900,000,000 for fiscal year 2010; and

(E) $1,000,000,000 for fiscal year 2011.

SEC. 5. AUTHORIZATION OF APPROPRIATIONS FOR THE DEPARTMENT OF ENERGY FOR BASIC RESEARCH.

Section 971(b) of the Energy Policy Act of 2005 (42 U.S.C. 16311(b)) is amended—

(1) in paragraph (2), by striking ''and'' at the end;

(2) in paragraph (3), by striking the period at the end and inserting a semicolon; and

(3) by adding at the end the following:

''(4) $5,320,000,000 for fiscal year 2010;

''(5) $5,851,000,000 for fiscal year 2011;

''(6) $6,436,000,000 for fiscal year 2012; and

''(7) $7,080,000,000 for fiscal year 2013.''.

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